

Notice of Allowability

Application No.

10/017,425

Examiner

Jean B. Corrielus

Applicant(s)

SEO ET AL.

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to 2/13/06.
2. ☒ The allowed claim(s) is/are 1 and 3-22, renumbered as 1-21, respectively.
3. ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 - a) ☒ All b) ☐ Some* c) ☐ None of the:
 1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

* Certified copies not received: _____.


Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.

THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

4. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
 5. ☒ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
 - (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
 - 1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
 - (b) ☒ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.
- Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☒ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3. ☐ Information Disclosure Statements (PTO-1449 or PTO/SB/08),
Paper No./Mail Date _____
4. ☐ Examiner's Comment Regarding Requirement for Deposit
of Biological Material
5. ☐ Notice of Informal Patent Application (PTO-152)
6. ☒ Interview Summary (PTO-413),
Paper No./Mail Date _____
7. ☒ Examiner's Amendment/Comment
8. ☒ Examiner's Statement of Reasons for Allowance
9. ☐ Other _____


Jean B. Corrielus
Primary Examiner
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4-28-06

DETAILED ACTION

EXAMINER'S AMENDMENT

1. An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

Authorization for this examiner's amendment was given in a telephone interview with David Oren on 4/26/06.

The application has been amended as follows:

IN THE CLAIMS:

Claims 1-9, 11-14, 18-21 and 23 has been amended as follow:

1. (Currently amended) A method for searching multipaths of a mobile communication system, the method comprising:

receiving respective inphase (I) and quadrature (Q) channel signals of a Dedicated Physical Control Channel (DPCCH) transmitted from a remote mobile station, the I and Q channel signals include symbol information and other control information;

[performing a] despreading [on] said I and Q channel signals [of a Dedicated Physical Control Channel (DPCCH) transmitted from a remote mobile station] to generate despread I and Q Channel [scrambling] signals [,];

multiplying the despread I and Q [scrambling] signals by a pilot pattern to
[performing a coherent accumulation] coherently accumulate the [on] pilot information
and coherently accumulate the other control information of each of said despread I and
Q channel signals, respectively, [and performing a coherent accumulation on another
information] to obtain respective coherently accumulated I and Q channel signals;

calculating energy values for each of the coherently accumulated I and Q
channel signals to obtain calculated energy values corresponding to the pilot
information and other information;

multiplying the calculated energy values corresponding to the pilot information by
a variable weight and multiplying the calculated energy values corresponding to the
[another] other information [section] by another variable weight, respectively;

noncoherently accumulating the energy values multiplied by variable weights and
storing the energy values;

comparing the stored energy values with a periodically designated threshold to
generate a comparison result; and

searching timing information in a number of fingers of said communication
system in order of highest to lowest energy values according to the comparison result.

Claim 2 has been canceled.

Claim 3, line 3, "another" has been replaced by --other--.

Claim 4, line 1, "2" has been changed to --3--.

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claim 5, line 1, "2" has been changed to --3--; line 3, "another" has been replaced by --other--.

Claim 6, line 1, "2" has been changed to --3--; line 1, "a" has been replaced by --the--; line 2, "a" has been replaced by --the--; line 3, "another" has been replaced by --other--.

Claim 7, line 3, "another" has been replaced by --other--.

8. (Currently Amended) An apparatus for searching multipaths of a mobile communication system, comprising:

[a] first and second decimators for performing a decimation process on [each] first and second channel signals inputted respectively in a predetermined sample rate, each channel signal comprising an inphase (I) signal and a quadrature (Q) signal, each of said inphase signal and said quadrature signal includes pilot information and other control information;

[an] first and second input buffers for storing outputs of the first and second decimators, respectively;

a complex despreader for despreading [the] a respective output[s through] of the first and second input buffers into despread inphase and quadrature [complex] signals using scrambling code signal generated based on a scramble control signal;

a first coherent accumulator for multiplying the despread inphase signal [output] by a pilot signal and coherently accumulating the [a] despread I signal including the pilot

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information and the [another] other information, to generate a first coherent accumulation signal;

a second coherent accumulator for multiplying the despread quadrature signal by said pilot signal and coherently accumulating the despread Q signal including the pilot information and the other information, to generate a second coherent accumulation signal;

an energy calculator for calculating an energy value of a Dedicated Physical Control Channel (DPCCH) using the first and second coherent accumulation signals from the first and second coherent accumulators;

a multiplier for multiplying the pilot information and the [another] other information of the energy value of DPCCH by [an appropriate] a respective weight, [respectively];

a noncoherent accumulator for noncoherently accumulating an output of the multiplier;

a search result storage for sequentially storing an output of the noncoherent accumulator in a sequence relative to the energy value; and

a digital signal processor for outputting a control signal to generate the scrambling code, for outputting said respective [different] weights according to the information of the DPCCH, and for periodically storing the energy value in an internal buffer of said DSP [the search result storage].

9. (Currently Amended) The apparatus of claim 8, wherein the first and second coherent accumulators each accumulates the pilot information of the DPCCH, and

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coherently accumulates the [another] other control information [except for the pilot information] of the DPCCH, respectively.

claim 11, line 3, "another" has been replaced by –other--.

claim 12, line 3, "another" has been replaced by –other--.

claim 13, line 2, "another" has been replaced by –other--.

14. (Currently amended) A method for searching multipaths of a mobile communication system, the method comprising:

receiving respective inphase (I) and quadrature (Q) channel signals of a Dedicated Physical Channel (DPCH) transmitted from a remote mobile station, the DPCH includes a Dedicated Physical Control Channel (DPCCH) and a Dedicated Physical Data Control Channel (DPDCH);

decimating the I and Q channel signals [of a Dedicated physical Channel (DPCH) transmitted from a remote mobile station] to generate respective decimated I and decimated Q channel signals, storing the decimated I and Q channel signals in [an] a first and second input buffers, respectively, and despread the decimated I and decimated Q channel signals from the first and second input buffers using a scrambling code signal to generate despread I and Q channel signals;

calculating an energy value of [a] said Dedicated Physical Control Channel (DPCCH) by multiplying the despread I and Q channel signals by a pilot pattern to generate multiplication outputs, coherently accumulating the multiplication outputs into

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first accumulated outputs, and calculating the energy value of the DPCCH from the first accumulated outputs; [.]

calculating an energy value of the Dedicated Physical Data Control Channel (DPDCH) by [.] dechannelizing the despread I and Q channel signals [to] using an orthogonal variable spreading factor (OVSF) to generate dechannelized despread I and Q channel signals and coherently accumulating the dechannelized channel signals into second accumulated outputs, and calculating the energy value of said DPDCH from the second accumulated outputs;

noncoherently accumulating the energy values of the DPCCH and the DPDCH and multiplying each energy value by a different weight[s] according to a spreading factor of the DPDCH;

adding the channel energy values multiplied by said different channel weights together, sequentially storing the sum and periodically comparing the stored channel energy values with a designated threshold; and

sending out a channel energy value greater than the threshold to a sort block, and searching timing information in order of high to low energy values, the number of channel energy being equal to a number of fingers in said mobile communication system.

18. (Currently Amended) An apparatus for searching multipaths of a mobile communication system, comprising:

an input for receiving a Dedicated Physical Channel (DPCH) signal from a remote mobile station, for filtering off the signal, and generating inphase (I) and quadrature (Q) channel

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signals, said signal includes a Dedicated Physical Control Channel signal (DPCCH) and a Dedicated Physical Control Data Channel signal (DPDCH);

[a] first and second decimators for receiving [, a Dedicated Physical Channel (DPCH) signal from a remote mobile station, for filtering off the signal,] and decimating I and Q channel signals at a designated ratio, respectively, the signals being inputted at a predetermined sample rate;

[an] first and second input buffers for storing an output of each of the first and second decimators, respectively;

a complex despreader for despreading the decimated I and Q channel signals stored in the first and second input buffers using a scrambling code signal generated based on the scrambling code control signal to generate [a] despread I and Q channel signals [output];

a first channel energy searcher for searching a first channel Dedicated Physical Control Channel (DPCCH) energy by multiplying the despread I and Q channel signals [output], respectively by a pilot signal and coherently accumulating respective [the] multiplication output to calculate an energy and by noncoherently accumulating the calculated energy;

a second channel energy searcher for searching a second channel Dedicated Physical Control Data Channel [(DPCCH)] (DPDCH) energy by dechannelizing the despread I and Q channel signals using an orthogonal variable spreading factor (OVSF), respectively, to generate dechannelized I and Q channel signals, by coherently accumulating the dechannelized I and Q channel signals, to calculate an energy, and by noncoherently accumulating the calculated energy;

a first multiplier for multiplying the calculated energy [the output] of the noncoherent accumulation of the first channel energy searcher by a first channel weight;

a second multiplier for multiplying the calculated energy of the noncoherently accumulation of the second channel energy searcher by a second channel weight;

an adder for adding up an output of the first multiplier and an output of the second multiplier;

a search result storage for storing an output value of the adder; and

a digital signal processor (DSP) for outputting [different] the first and second channel weights according to a spreading factor of the DPDCH, for storing the search energy values saved in the search result storage to a memory of the DSP, for comparing the stored search value with a threshold, and if the search energy value is greater than the threshold, searching for timing information in order of high to low energy values, in a number of fingers in said mobile communication system.

19. (Currently Amended) The apparatus of claim 18, wherein the first channel energy searcher comprises:

first and second coherent accumulators ;

a first energy calculator for calculating [an] said energy of the DPCCH based on a respective coherently accumulated signal outputted by the first and second coherent accumulators; and

a first noncoherent accumulator for noncoherently accumulating an output of the first energy calculator.

20. (Currently Amended) The apparatus of claim 19, wherein the second channel energy searcher comprises:

third and fourth multipliers for dechannelizing the despread [outputs] I and Q channel signals generated by the complex despreader by multiplying the despread [output] I and Q channel signals by the orthogonal variable spreading factor (OVSF) to distinguish the channel and to generate said dechannelized despread I and Q channel signals;

third and fourth coherent accumulators for coherently accumulating [outputs of the third and fourth multipliers] said dechannelized despread I and Q channel signals, respectively;

a second energy calculator for calculating [an] said energy value of said [a] DPDCH [out of] from a respective [the] coherent accumulation signal generated by the [first] third and [second] fourth coherent accumulators; and

a [fourth] second noncoherent accumulator for noncoherently accumulating an output of the second energy calculator.

21. (Currently Amended) The apparatus of claim 18, wherein [the digital signal processor generates a first channel weight and a second channel weight according to the spreading factor of the DPDCH,] the two weights being complements to each other and the sum of the two being 1, and the digital signal processor outputs the weights to the first multiplier and the second multiplier, respectively.

Claim 23 has been canceled.

Drawings

2. The following changes to the drawings have been approved by the examiner:

Fig. 1 and Fig. 2 have been labeled as "related art". In order to avoid abandonment of the application, applicant must make such drawing changes.

3. The following is an examiner's statement of reasons for allowance: as per claim 1 see reasons for allowing claim 8. As per claim 18, see reasons for allowing claim 14.


Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jean B. Corrielus whose telephone number is 571-272-3020. The examiner can normally be reached on Maxi-Flex.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jay Patel can be reached on 571-272-2988. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


Jean B Corrielus
Primary Examiner
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4-28-06



REPLACEMENT SHEET .

Fig. 1 (Related Art)

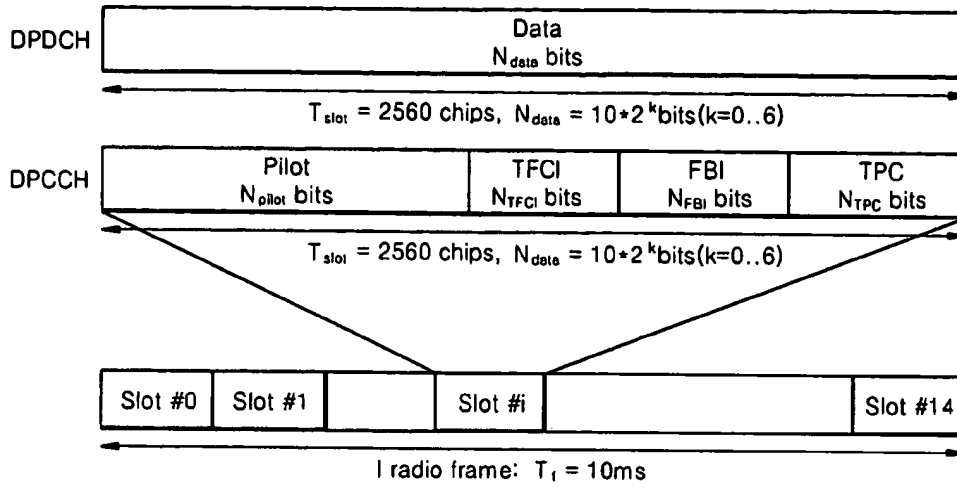


Fig. 2 (Related Art)

